MITOCHONDRIA

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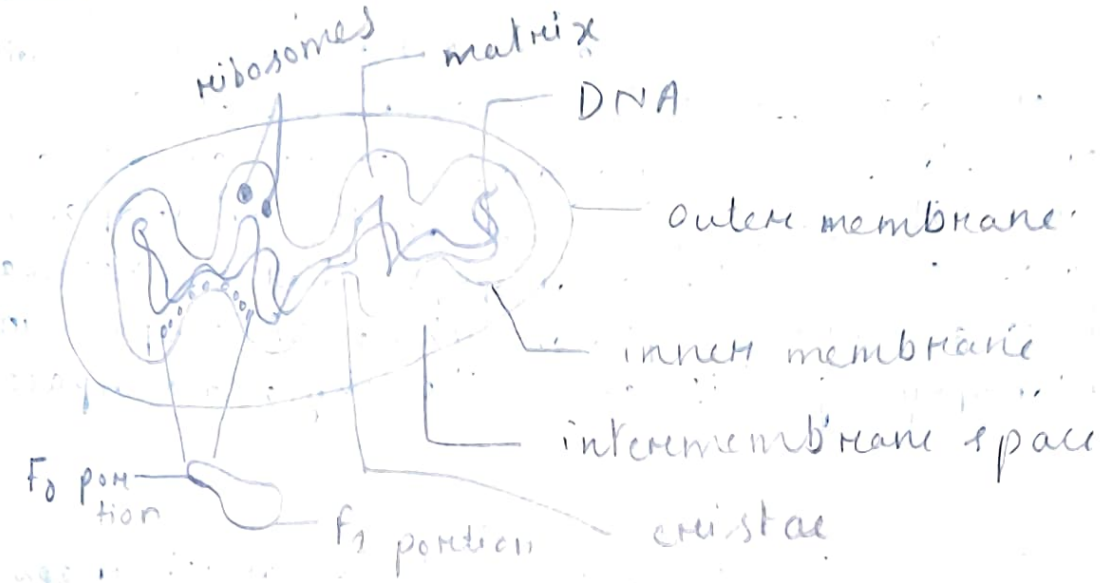

Fig: Mitochondria

Structure of Mitochondria:

Mitochondria are double membrane large cell organelles. Mitochondria consists of two membrane, one is outer membrane and the other is inner membrane. Each are 60-75 A° thick. Both membrane comes in contact with each other at same points called contact zones or adhesive sites.

Functions of Mitochondria:

(i) Mitochondria is a site of cellular respirations. The major energy transformation process such as TCA cycle or Krebs and electron transport system occurs inside the mitochondria

(ii) It is known as power house of the cell or ATP mill of the cell and ATP is known as energy currency of the cell.

(iii) Storage of calcium ion and synthesis of steroids.

(iv) Different types of proteins, carbohydrates and fats are oxidised and degraded through mitochondria.

CHLOROPLAST :

Structure of Chloroplast :

Chloroplast can be found in the cells of the mesophyll in plant leaves. There are usually 30-40 per mesophyll cell. The chloroplast has an inner and outer membrane with an empty intermediate space in between. Inside the chloroplast are stocks of thylakoids, called grana as well as stroma. the dense fluid inside the chloroplast, these thylakoids contain the chlorophyll that is necessary for the plant to go through photosynthesis. The space in which the chlorophyll fill is called the thylakoid space.

Functions :

(i) Chloroplast is the site of photosynthesis which traps solar energy and transform it into chemical energy.

(ii) Carbon assimilation occurs in the stroma of chloroplast, where CO_2 is converted to sugars (glucose) and that to starch.

(iii) Starch obtained by carbon assimilation is stored.

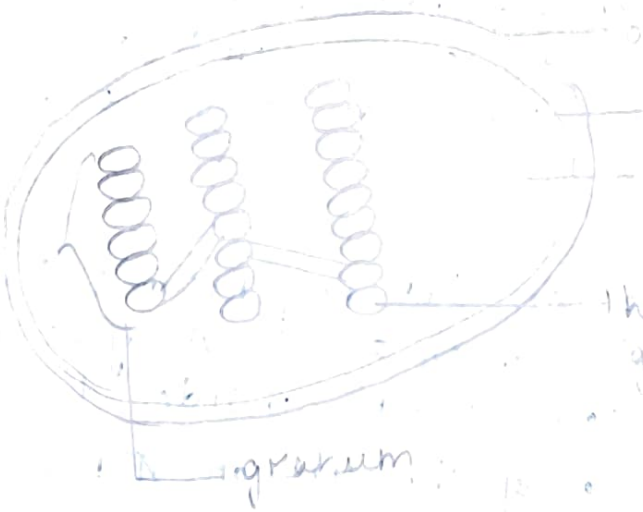

Fig : Chloroplast

PEROXISOME :

Peroxisomes are membrane bound organelle (formerly known as microbody), found in the cytoplasm of virtually all eukaryotic cells. Peroxisomes are oxidative organelles. They are small vesicles, single membrane-bound organelles. They contain digestive enzymes for breaking down toxic materials in the cell and oxidative enzymes for metabolic activity.

Peroxisomes play an important role in lipid production and are also involved in the conversion of reactive oxygen species such as hydrogen peroxide into safer molecules like water and oxygen by the enzyme catalase.

Structure of Peroxisomes :

Peroxisomes vary in shape, size and number depending upon the energy requirements of the cell. These are made of a phospholipid bilayer with many membrane bound protein. The enzymes involved in lipid metabolism are synthesised on free ribosomes and selectively imported to peroxisomes. These enzymes include one of the two signalling sequences. The phospholipids of peroxisomes are usually synthesised in SER. Due to the ingress of proteins and lipids, the peroxisome grows in size and divides into two organelles. Peroxisomes donot have their own DNA. Proteins are transported from the cystol after translation.

Functions of Peroxisomes :

(i) The main function of peroxisomes is the lipid metabolism and the processing of reactive oxygen species.

(ii) They take part in various oxidative processes.

(iii) They take part in lipid metabolism and catabolism of D-amino acids, polyamines and bile acids.

(iv) The reactive oxygen species such as peroxides produced in the process is converted to water by various enzymes like peroxidase and catalase.

(v) In plants, peroxisomes facilitate photosynthesis and seed germination. They prevent loss of energy during photosynthesis carbon fixation.